

**Claims**

1. An ultrasound imaging system comprising:
  - a probe (10) with an array of transducer elements (12) for acquiring ultrasound data of a body, including moving tissue and fluid flow;
  - 5 a beamforming system (10, 12, 14, 16) for emitting and receiving ultrasound beams in said body, which uses, for each transmission beam, an ensemble length of more than two temporal samples and less than eight; processing means (40, 50) to process flow Doppler signals comprising adaptive clutter demodulation (21) applied on amplitude signals and means
  - 10 clutter demodulation applied on phase signals followed by high-pass filtering (22, 32); and display means (55,70) to display images based on said processed flow Doppler signals.
- 15 2. The ultrasound imaging system of claim 1, wherein the filtering means comprises second order Infinite Impulse Response filters.
3. The ultrasound imaging system of claim 1, wherein the filtering means comprises third order Infinite Impulse Response filters for filtering amplitude
- 20 signals.
4. The ultrasound imaging system of one of Claim 1 to 3, wherein the filtering means are followed by post-processing means comprising spatial averaging means for yielding respectively power Doppler signals from the amplitude signals and flow velocity signals from the phase signals.
- 25 5. The ultrasound imaging system of one of Claims 1 to 4, wherein the post processing means comprises amplitude averaging means applied to the amplitude data and velocity averaging means applied to the velocity data resulting of high-pass filtering means, for performing a spatial averaging of the
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results provided by said filters and permitting of compensating for the use of small ensemble length less than eight.

6. The ultrasound imaging system of Claim 5, wherein the processing  
5 means comprises a color flow velocity processor for mapping flow velocity  
values on color values.

7. The ultrasound phased array imaging system of Claim 5, wherein the  
processing means comprises a color power processor for mapping the estimated  
10 power magnitude on color values.

8. The ultrasound imaging system of one of Claims 1 to 7, comprising a B  
mode processor for processing the amplitude information of the echo signals  
(RF), on a spatial basis, for the formation of structural images of the tissue.  
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9. The ultrasound imaging system of one of Claims 1 to 8, comprising:  
a display processor for processing the B mode data, color flow velocity  
data, color power data, and an image memory for memorizing the image data for  
display; and  
20 a user control for the user to select the images to display in one mode  
or in combined modes.

10. An ultrasound examination apparatus having a probe for acquiring  
ultrasound data and coupled to a system as claimed in one of Claims 1 to 9.  
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11. A program product having a set of instructions for operating the  
functions of the means of the system as claimed in one of Claims 1 to 9.